DOCUMENT RESUME

ED 106 408 UD 015 144

AUTHOR	Weiss, Leonard; Williamson, Jeffrey G.
TITLE	Black Education, Earnings, and Interregional Migration: Some New Evidence. Discussion Papers No. 87-70.
INSTITUTION	Wisconsin Univ., Madison. Inst. for Research on Poverty.
SPONS AGENCY	Office of Economic Opportunity, Washington, D.C.
REPORT NO	IRP-DP-87-70
PUB DATE	Dec 70
NOTE	46p.
EDRS PRICE	MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS	Age Differences; Census Figures; Economic Research; Educational Policy; Educational Quality; *Geographic Distribution; *Income; Migration; *Negro Education; Negro Employment; Poverty Research; Public Policy; *School Role; Southern Schools; *Statistical Analysis

ABSTRACT

Studies using 1960 Census data found that Black returns to education are erratic and much lower than for whites even when some correction is made for their region of birth. The weak effect of education on black income might be attributed to the alleged low quality of Negro education provided in parts of the South. The 1967 Survey of Economic Opportunity made it possible to re-examine the education-income relation for a more recent period of labor market experience. The sample consisted of a Current Population Survey for 1967 augmented by a special sample drawn from low-income areas. Among other questions, respondents surveyed were asked their place of residence at age 16. The answer should offer a excellent proxy for geographic source of education. Part 1 of this report is an "Introduction'. Part 2 builds upon the earlier earnings functions studies using later data and introduces the improved region of education variables. In Part 3, Markov techniques are used to project the black male labor force by region, age and education over the period 1967-68. Then 1967 incomes are applied to these labor-force figures to estimate the expected path of black income and poverty experience over the next two decades. Finally, some conclusions are presented in Part 4. (Author/JM)

87-70

INSTITUTE FOR RESEARCH ON POVERTY DISCUSSION PAPERS

BLACK EDUCATION, EARNINGS, AND INTERREGIONAL MIGRATION: SOME NEW EVIDENCE

Leonard Weiss and Jeffrey G. Williamson

UNIVERSITY OF WISCONSIN - MADISON

ED108408

BLACK EDUCATION, EARNINGS, AND INTERREGIONAL MIGRATION: SOME NEW EVIDENCE

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Leonard Weiss

Jeffrey G. Williamson

UD 015144

We gratefully acknowledge the research assistance of Earl Kinmouth, Richard Kaluzny and Nancy Williamson. The paper has benefited considerably from the comments of Dennis Aigner, Glen Cain, Arthur Goldberger, Harold Watts and Robinson Hollister. The Research reported here was supported by funds granted to the Institute for Research on Poverty at the University of Wisconsin by the Office of Economic Opportunity pursuant to the provisions of the Economic Opportunity Act of 1964. The conclusions are the sole responsibility of the authors.

December 1970

I. INTRODUCTION

The voluminous recent literature on the role of education in racial income differentials leaves a number of unanswered questions which are critical to the formulation of policy in northern urban ghettos. One of the most striking results using 1960 Census data is that black returns to education are erratic and much lower than for whites (Hanoch, 1965; Thurow, 1969) even when some correction is made for their region of birth (R. Weiss, 1970). These discouraging results leave migration as almost the only systematic means of improving the relative income position of blacks, but even the value of migration may be exaggerated given that the most promising people migrate (Kain and Persky, 1967). In general these earlier studies, based on the 1960 Census, offer bleak prospects for elimination of black poverty.

A possibly more hopeful view might attribute the weak effect of education on black income to the alleged low quality of Negro education provided in parts of the South. The traditional view is that southern black migrants are "poorly educated, have high levels of unemployment and low incomes, and place disproportionate demands on welfare and public services" (Kain and Persky, 1967, p. 294). The low quality of black in-migrants to northern cities might be explained by a long history of systematic discrimination in the provision of public education. If interregional differences in the quality of black education account for a large part of the poverty in the northern ghetto, then the natural policy conclusions would seem to be that the North should devote more resources to southern black education (Kain and Persky, 1967). Moreover, the northern black-white income differential might be expected to diminish in the future,

since a large share of the current northern black population received its education in the South while a much larger proportion of the next generation of northern blacks will have northern educations. This hypothesis is not inconsistent with the research cited above, since other studies on the black education-income relationship were unable to identify the regional source of education.

The 1967 Survey of Economic Opportunity makes it possible to investigate this more optimistic hypothesis more thoroughly and to reexamine the education-income relation for a more recent period of labor market experience. The sample consists of a Current Population Survey for 1967 augmented by a special sample drawn from low-income areas. Among other questions, the persons surveyed were asked their place of residence at age 16. The answer should offer an excellent proxy for geographic source of education.

The present study attempts to reevaluate these hypotheses utilizing this new data body. Part II builds upon the earlier earnings functions studies using later data and introducing the improved region of education variables. In Part III we utilize Markov techniques to project the black male labor force by region, age, and education over the period 1967-87. Having done so, we then apply 1967 incomes to these labor-force figures to estimate the expected path of black income and poverty experience over the next two decades. Finally, some conclusions are presented in Part IV.

II. THE DETERMINANTS OF BLACK MALE INCOMES: 1967

This section estimates black earnings functions in the United States. We disaggregate into five "regional" labor markets: rural South, small-city South, medium-city South, large-city South, and non-South (primarily

urban North). No breakdown of the non-South category was attempted because the rural and small-town northern black population is not large, and inter-city differences in black earnings functions within the North and West were not expected to be important. It seems reasonable to hypothesize that most of the variance in environmental and school quality is captured in these five regional classifications.

We hope to isolate the returns to black education by controlling for the traditional variables as well as present residence and geographic source of education. Years of education by itself has long been recognized as a poor proxy for training (Becker, 1964, pp. 79-88, 124-27). The Coleman Report yields some quantitative evaluation of the divergence between student "achievement" and years of formal education. Taking northeastern urban whites as the standard, the achievement variable reported in Table 1 is the number of years of schooling less the average grades behind the white urban northeasterners.[1] To the extent that quality of schooling affects achievement, this evidence supports the common observation regarding the low quality of black schools. The data in Table 1 also suggest that regional variation in the quality of black schooling exceeds that of white. Coupling these data with the evidence of greater rates of in-migration to northern cities by southern blacks than whites, it appears reasonable to appeal to regional variance of the educational and environmental quality of black training as a potential explanation for the poor association in the aggregate between black education and earnings.

The quality of education which black migrants from the South bring with them to northern cities may have a significant impact on the economic position of northern blacks. In addition to shedding light on this issue,

Table 1. Achievement of Individuals:
Standardized Years of Schooling

Region and Race	Adjusted Years of Schooling for Years of Schooling Completed: 8 years	12 years
White		
Urban		
Northeast	8.0	12.0
North Central	8.0	11.6
South	7.5	11.1
West	7.7	11.5
Nonurban		
Northeast	7.7	11.1
North Central	7.7	11.1
South	7.1	10.5
West	7.7	11.1
Black		
Urban		
Northeast	5.9	8.7
North Central	6.0	8.7
South	5.3	7.8
West	5.6	8.1
Nonurban		
Northeast	5.6	7.8
North Central	5.6	7.8
South	4.6	6.8
West	5.6	7.8

Source: Reported in R. Weiss (1970), Table 1, p. 4, where it is derived from J. Coleman (1966), T. 3.121.1. p.274.

our region-of-education variable may yield evidence about the possible decrease in interregional educational quality differentials with the improvement in southern school systems and the (alleged) deterioration of northern ghetto schools, and about the effect of migrations on income, having controlled for the level and location of education.

The study is limited to income from work, business, or farming for black males of working age (20-64). We avoid all consideration of sex differences because we feel that male income is the crucial variable in

determining the possibility of moving large numbers of Negro families out of poverty. Our analysis is restricted to labor and self-employment income because it is such incomes that are most likely to be affected by the quantity and quality of education, and by migration. In any case, property incomes would not be important for the groups covered in this study, and transfer payments are an inappropriate element of income since our concern is with the ability of blacks to attain higher economic status via education and mobility, not via welfare payments. We include the entire Negro male population of working age, whether employed or not, since we expect age, origin of education, and mobility to influence income through unemployment as well as through wage rates.

To accomodate the projections in Part III of this paper, the age, education, region of education, and current region of residence variables were introduced by classifying individuals on a four-way basis. The classes used are as follows:

Age Classes	Education Classes	Residence at Age 16 Classes	Residence in 1967 Classes
20-24	Less than 8 years	Rural South (<2500 population)	(Same as residence at age 16)
25-29	8-11 years	Small-town South (population 2500 to 50,000)	
30-34	12 years	Small southern SMSA's (population <250,000)	
35-39	More than 12 years	Large southern SMSA's (population ≥250,000)	
40-44		North or West	
45-49			
50-54			
55-59			
60-65			

This cross-classification produced 900 cells, 541 of which were filled in 1967. Mean incomes within each cell were computed for the income projections in Part III, but these results are difficult to summarize. The results seem easiest to interpret in regression form.

The earnings function initially utilized for estimation is a multiple linear regression in a single equation and should be viewed as a reduced form equation incorporating both demand and supply effects (Hanoch, 1965, p. 6). Regressions were estimated for each 1967 residence group separately and again for the entire sample. Where the entire sample was used, additional variables were introduced for 1967 residences. Regressions were run with absolute income and again with log of income as the dependent variable. The four resulting regressions for the entire sample appear in Table 2. In the first two regressions each of our classifications is treated as a variable. The second two allow for a region-of-education--age interaction to test the possibility that regional quality differences in education have changed over time, and an age-education interaction because of the well-known tendency for education to affect incomes in later years more than in early years. To facilitate computation, the age classification was collapsed into four age groups in the interaction regressions. The projections in Part III, of course, retain the full interaction detail implicit in the 900 cells created in our basic four-way classification.

The results of the four regressions are shown in Table 2 on pp. 7-9. The dependent variable is the income from work and from self-employment in 1967 in equations (1) and (3) and its natural logarithm is (2) and (4). The constant term shows the average income of black males with less than

an eight-grade education who were educated in the rural south and lived there in 1967. In the first two regressions the constant refers to those of age 20-24, and in the third and fourth, to those of age 20-29.

Table 2. Regressions Relating Income from Work and Self-Employment to Education, Residence, and Age
Black Males, 1967
(t-values in parentheses)

Equation		(1)	(2)			(3)	(4)
		Coefficient				Coefficient	
Variable		Absolute Income Dependent	Log Income Dependent	Variable		Absolute Income Dependent	Log Income Dependent
Constant		287.02	6.045	Constant		1503.36	6.583
		(2.36)	(50.91)			(7.44)	(33.19)
Education	8-11 years	677.80	0.583	Education	8-11 years	381.40	.646
		(8.34)	(7.36)			(1.72)	(2.96)
	12 years	1246.38	0.859		12 years	926.24	.939
		(12.76)	(9.01)			(4.09)	(4.21)
	>12 years	2424.38	0.922		>12 years	701.38	.248
		(20.91)	(8.15)			(2.66)	(0.96)
Residence at 16	Small-town South	-26.73	-0.153	Residence at 16	Small-town South	72.02	-.106
		(-0.20)	(-1.18)			(0.26)	(-.39)
	Southern SMSA <250,000	140.11	-0.022		Southern SMSA <250,000	-251.44	-.488
		(1.04)	(-0.16)			(-1.01)	(1.00)
	Large-SMSA South	-187.57	-0.325		Large-SMSA South	-462.28	-.516
		(-1.75)	(-3.11)			(-2.31)	(-2.62)
	North	-31.26	-.200		North	-445.23	-.461
		(-.30)	(-1.97)			(-2.37)	(-2.50)
Residence in 1967	Small-town South	415.93	.510	Residence in 1967	Small-town South	423.33	.522
		(1.78)	(2.23)			(1.80)	(2.26)
	Small-SMSA South	804.37	.431		Small-SMSA South	860.37	.466
		(5.13)	(2.82)			(5.44)	(3.00)
	Large-SMSA South	1519.27	.662		Large-SMSA South	1589.42	.687
		(12.57)	(5.62)			(13.05)	(5.74)
	North	2232.34	.776		North	2326.31	.814
		(19.40)	(6.91)			(20.08)	(7.15)
Age	24-29	1150.14	.691	Age	30-39	472.82	.384
		(9.13)	(5.62)			(1.93)	(1.59)
	30-34	1551.00	.799		40-49	440.12	.098
		(12.51)	(6.61)			(1.89)	(0.43)

Table 2 Cont'd
Regressions Relating Income from Work and Self-Employment to Education, Residence, and Age
Black Males, 1967
(t-values in parentheses)

Equation	(1)	(2)			(3)	(4)
	Coefficient				Coefficient	
Variable	Absolute Income Dependent	Log Income Dependent	Variable		Absolute Income Dependent	Log Income Dependent
35-39	1837.86 (14.12)	.849 (6.69)	50-65		-125.13 (-0.56)	.810 (-3.67)
40-44	1996.91 (15.97)	.914 (7.50)				
45-49	1910.33 (14.88)	.680 (5.44)				
50-54	1632.53 (12.30)	.454 (3.51)				
55-59	1198.35 (8.43)	-0.110 (-.79)				
60-64	572.46 (3.80)	-1.013 (-6.90)				
			Residence at 16 for those age 30-39	Small-town South	-441.35 (-1.22)	-.244 (-.69)
				Small-SMSA South	402.07 (1.28)	.418 (1.36)
				Large-SMSA South	94.28 (0.36)	.069 (0.27)
				North	229.24 (0.92)	.031 (0.13)
			Residence at 16 for those age 40-49	Small-town South	120.65 (0.34)	.105 (0.30)
				Small-SMSA South	482.83 (1.55)	.674 (2.20)
				Large-SMSA South	526.78 (2.08)	.467 (1.88)
				North	784.86 (3.18)	.507 (2.09)
			Residence at 16 for those age 50-64	Small-town South	-134.89 (-.39)	-.044 (-.13)
				Small-SMSA South	435.04 (1.44)	.548 (1.84)

Table 2 Cont'd
Regressions Relating Income from Work and Self-Employment to Education, Residence, and Age
Black Males, 1967
(t-values in parentheses)

Equation	(1)	(2)			(3)	(4)
	Coefficient				Coefficient	
Variable	Absolute Income Dependent	Log Income Dependent		Variable	Absolute Income Dependent	Log Income Dependent
				Large-SMSA	287.77	.130
				South	(1.15)	(0.52)
				North	462.30	.374
					(1.93)	(1.59)
R^2	.259	.104				
d.f. = 5765-20	5745	5745				
			Education for those 30-39	8-11 years	317.95	-.088
					(1.14)	(-.32)
				12 years	365.89	-.128
					(1.24)	(-.44)
				>12 years	1923.31	.730
					(5.49)	(2.12)
			Education for those 40-49	8-11 years	262.13	-.160
					(.99)	(-.61)
				12 years	206.52	-.236
					(.70)	(-.81)
				>12 years	2595.31	1.074
					(7.57)	(3.19)
			Education for those 50-64	8-11 years	248.03	.051
					(.94)	(0.20)
				12 years	30.60	.049
					(.10)	(0.16)
				>12 years	2752.50	1.426
					(7.62)	(4.02)
			R^2		.258	.090
			d.f. = 5765 - 36		5729	5729

Our conclusions from these regressions are that age, education, and residence are major determinants of black male income but that region of education has an equivocal effect. We have explored the effect of each of these variables more thoroughly using separate regressions for each region. The results appear in Table 3.

Age has a significant and systematic effect of the expected pattern. The five regional regressions are summarized in Table 3, which shows estimated income of nonmigrants with 8-11 years of education (the overall median education class). Income peaks earliest in the rural South and latest in the urban North as might be expected, and for almost all age groups income increases as we move from the rural South category to the North.

Table 3. Estimated Incomes for Black Males: Nonmigrants, 8-11 years of Education

	1967 Residence				
Age	Rural South	Small-town South	Small-SMSA South	Large-SMSA South	North
20-24	1898	1434	1996	2131	2830
25-29	2181	1889	3071	3344	4285
30-34	2575	2556	3895	3716	4595
35-39	2525	2626	3635	4315	4927
40-44	2368	2772	3884	4433	5180
45-49	2158	2581	3415	4160	5385
50-54	2122	3051	3101	3888	5012
55-59	1773	2512	3025	3873	4207
60-64	1328	1847	2256	2761	3831

As expected, our regression results show that region of residence has a very strong effect on earnings with the income advantage increasing

systematically from rural South to non-South. Certainly a significant portion of this differential is due to the tendency for those with higher potential to migrate to the larger cities and the North. It is evident from the data used in Part III that migration rates are far greater in the rural and small-city South among the more educated groups. Our regressions control for education, but migrants undoubtedly self-select on other bases as well. This can best be shown by reference to Table 4, which compares computed incomes for persons in the overall median age and education groups by origin of education and 1967 residence. Average incomes (weighted by numbers in the SEO tape) for the in-migrants are shown at the bottom of each column.

Table 4. Estimated Income for Black Males Setting Age at 40-44 and Education at 8 to 11 Years by Residence at Age 16 (Total Numbers of Observations in Parentheses)

Residence at Age 16	Residence in 1967: Rural South	Small Town South	Small SMSA South	Large SMSA South	North	All Observations
Rural South	2368 (910)	2747 (25)	3866 (117)	4562 (357)	5253 (489)	(1898)
Small-town South	2652 (15)	2772 (103)	3943 (32)	4678 (125)	5130 (218)	(493)
Small-SMSA	1664 (5)	3253 (2)	3883 (418)	4877 (88)	4666 (154)	(667)
Large-SMSA	1494 (4)	2945 (5)	3891 (14)	4433 (907)	4374 (255)	(1185)
North	4236 (8)	3986 (3)	3777 (5)	4867 (39)	4489 (1467)	(1622)
In-Migrants	2436 (32)	2910 (35)	3880 (168)	4651 (609)	4947 (1116)	
All observations	(942)	(138)	(586)	(1516)	(2583)	(5765)

The nonmigrants appear on the diagonal. They generally earn less than the immigrants to their region (shown at the bottom), even with age and education controlled. Yet, a strong interregional discrepancy still remains as can be seen by comparing the estimated incomes of the nonmigrants along the diagonal.

The geographical source of education has strikingly little systematic effect on earnings. None of the "Residence at Age 16" coefficients were significantly different from zero in the absolute income regression. In the logarithmic and the interaction regressions, those who received their educations in the North or the large southern SMSA's received significantly lower incomes.[2] The same pattern held within most age groups in the North (not shown), suggesting that there has been little relative change over time in the income effect of interregional quality differences in black education.[3]

Our overall conclusion must be that interregional differences in the quality of black education have relatively weak effects on earning ability. A possible explanation for this result is that other features of rural southern origin may outweigh the disadvantage of low-quality formal education there. An implication is that the geographical shift in population can only improve Negro incomes by the positive impact on income from migration and by increasing the number of years of school completed by migrant's children.

Education has a strong and consistent effect on black incomes for the sample as a whole, and for each age group in the interaction equation. The same conclusion generally holds within each of the five regions separately, but the relative gain from education is greatest in the North

and least in the rural South. These results differ sharply from previous studies which have found little effect for education using 1960 Census data (Hanoch, 1965; R. Weiss, 1970; Thurow, 1969), especially at high education levels.

In an effort to determine the source of differences between our results and those based on the 1960 Census, we applied Thurow's model to our data. Thurow's human-capital function has a somewhat different specification than our own. His specification is

$$Y_{ik} = A \prod_{g=1}^{n} Ed_i^{bg} \prod_{l=1}^{m} Ex_k^{cl}$$

where g = education class, l = experience class, b and c are income elasticities, i = years of education, and k = years of experience. The experience variable is defined as the number of years in the labor force, presumably absorbing on-the-job training, from school departure or from age 18, whichever comes later. The regression results using the 1967 SEO data are presented in Table 5, while a comparison with Thurow's 1960 results are summarized in Table 6.[4]

Table 5. Thurow's Human Capital Function Estimated on 1967 SEO Data

Sample	Constant Term	Coefficients of Education			Coefficients of Experience				$\bar{R}^2$	SEE
		b_1	b_2	b_3	c_1	c_2	c_3	c_4		
All Black	3.7421 (22.1197)	-1.5902 (7.1605)	0.0236 (0.0420)	1.7718 (3.9407)	0.9073 (4.1502)	0.6942 (3.0025)	4.0486 (9.7848)	-4.0490 (12.0667)	.143	2.309
North Black	3.8266 (14.2110)	-1.2579 (3.6030)	-0.0453 (0.0566)	1.5086 (2.3913)	1.1588 (3.5232)	0.1777 (0.5066)	5.5192 (7.9589)	-5.1526 (8.8777)	.141	2.358
South Black	3.8598 (17.0667)	-1.4728 (4.8587)	-0.5627 (0.6994)	2.2222 (3.4486)	0.7295 (2.4962)	1.0891 (3.5472)	3.1310 (6.0483)	-3.4439 (8.3868)	.136	2.262

Note: Estimated from the equation $Y_{ik} = A \prod_{g=1}^{n} Ed_i^{bg} \prod_{l=1}^{m} Ex_k^{cl}$ (see text). Figures in parentheses are t-values.

Table 6 reports computed income elasticities for 1960 and 1967, for the South, North, and the United States as a whole. The results confirm our earlier tentative conclusion. Thurow found education elasticities lower for nonwhites for all education classes and for all regions using 1960 data. The discrepancies were especially notable for the highest education classes. The 1967 sample suggests a dramatic change. Income elasticities with respect to education have increased in all regions and all education classes. In fact, the data suggest higher elasticities for blacks in 1967 than for whites in 1960! The most remarkable shifts took place in the 0-8 and 9-12 years of schooling classes. For example, in the North the income elasticity with respect to education for class 0-8 years jumps from 0.06 to 0.21. It appears that returns to black education in 1967 were at least as great as for whites in 1960.

The secular shift in the impact of the experience variable is somewhat different. Systematic changes appear to have taken place only for very young black males. The income elasticity with respect to experience for black males with five years' experience or less has undergone enormous improvement.

These results emphasize the importance of the two sources of black improvement over the last decade. First, full employment conditions surely explain much of the shift in the experience elasticity among the young. But second, there appears to have been an independent shift in the incidence of discrimination at all education levels as well. The strong effect of secondary and even primary education on black male incomes in 1967 suggests that the improved opportunities in 1967 extended considerably beyond the token employment of a few black executives and

Table 6. Income Elasticities of Education and Experience for Males, by Color and Region, 1960 and 1967

	Years of Education			Years of Experience			
Sample	0-8	9-12	12+	0-5	6-15	16-35	35+
All white (1960)	0.11	0.72	1.73	0.20	0.71	-0.09	0
All nonwhite (1960)	0.08	0.76	1.33	0.26	0.65	-0.14	0
All black (1967)	0.21	1.80	1.77	1.60	0.69	0.00	-4.05
Northern white (1960)	0.10	0.52	1.70	0.20	0.70	-0.06	0
Northern nonwhite (1960)	0.06	0.51	1.22	0.27	0.63	-0.11	0
Northern black (1967)	0.21	1.46	1.51	1.70	0.54	0.37	-5.15
Southern white (1960)	0.11	0.90	1.91	0.20	0.75	-0.21	0
Southern nonwhite (1960)	0.08	0.57	1.74	0.24	0.61	-0.26	0
Southern black (1967)	0.19	1.66	2.22	1.51	0.78	-0.31	-3.44

Sources: The 1960 figures are from Thurow, 1969, Table 5-1, p. 77. The 1967 figures are calculated from Table 5.

Table 7. Thurow's Human Capital Function With R(16): Northern Black Males, 1967[a]

Variable	Coefficient	Variable	Coefficient	
Constant	4.1683 (14.6108)	Education		$\bar{R}^2$ = 0.145
Residence at Age 16: R(16)		0-8	-1.3708 (3.9072)	
Small-town South	-0.3695 (1.9214)	9-12	-0.0594 (0.0741)	SEE = 2.355
Small southern SMSA	-0.2037 (0.9307)	12+	1.5304 (2.4222)	
Large Southern SMSA	-0.4521 (2.4784)	Experience		
Non-South	-0.4421 3.5225	0-5	1.1466 (3.4891)	
		6-15	0.2213 (0.6313)	
		16-35	5.4188 (7.8140)	
		35+	-5.1029 (8.7967)	

[a]Estimation equation identical with that reported in Table 5, except the residence at age 16 variable is added. Figures in parentheses are t-values.

clerks that was so often noted in the late 1960's. The issue confronted in Part III is whether these parameter changes in black earnings functions are likely to produce significant future shifts in black poverty and average incomes.

Finally, in Table 7 we report our results when, for the northern sample, the "educational quality" variable is appended to Thurow's human capital function. Again we find evidence that blacks educated in the rural South have distinct advantage while those educated in the large

southern or northern cities suffer significant disadvantage. Inclusion of region of education does not significantly change the education and experience coefficients.

III. MIGRATION AND FUTURE BLACK INCOMES: 1967-87

One of the prime purposes of this section is to confront the conventional position that, in view of two decades of unchanged black-white income differentials,

> There is no reason to predict abrupt changes in the shape of the income distribution, the extent of discrimination, or the speed with which poverty is eliminated. . . . The distribution is actually a product of the underlying distribution of human and physical capital, the level of productivity, the organization of the economic system, discrimination and many other factors. Unless positive evidence can be found that these elements are going to change autonomously, there is no reason to think that the income distribution will suddenly start to take new directions (Thurow, 1969, pp. 24-25).

This section will project black incomes over the next two decades and explore the sources of growth in black incomes by reference to the changes in the labor force composition through migration, education, and shifts in the age distribution.

In order to predict the future distribution of black incomes, we must first project their distribution by age, education, and residence. The projection uses the 1967 population distribution and the death, education, and migration rates prevailing at the time of the survey. Since we wish to avoid estimating births, we limit our analysis to only the black male population age 20-64 and project only to 1987. Estimates are produced for five-year intervals for individuals in each age-education-region at 16--current residence cell. Deaths are estimated on

the basis of the 1967 nonwhite male mortality rates and no attempt is made to distinguish among regions in predicting mortality.

Education of those age 20 and over is assumed fixed at the 1967 level, but it is specific, of course, to region of residence.[5] Education for those less than 20 years of age in 1967 is predicted by applying the education levels of the current (1967) 20-24 age group based on region of residence at age 16. For example, 4.5 percent of the black males in the North at ages 15-19 are assigned to the 0-7 years schooling class, 37.7 percent to the 8-11 years class, 38.6 percent to the 12 years class, and 19.1 percent to the more than 12 years class. These in fact were the distributions prevailing in 1967 for the males aged 20-24 who had lived in the North at age 16. Our projections do not allow for any increase in years of education within any region (for future entrants to the labor force) although a projected increase for the national black population as a whole can occur through migration and the replacement of retirements from the labor force with more highly educated black youth.

Adult migration rates for each of the thirty six age-education classes has been estimated from the SEO sample, and we assume them to be stable over the projection period.[6] Migration rates for males age 15 or less were estimated using all children in households with female heads (or wives) on the basis of the female head's estimated residence five years earlier. The resulting migration probabilities were applied to all black male children in the SEO file.

Thus the simulation reported in this section is based on a simple Markov process. We assume stability in the observed 1967 migration rates over the subsequent two decades. Although this key assumption imposes

serious limitations on an analysis of future spatial distributions of the American black male labor force, it seems to us the only viable model useful for effectively capturing the influences of migration and regionally specific quality of education on the incidence of poverty and income levels in northern urban ghettos. In both theory and fact (Kelley and Weiss, 1969) we know migration to have an important impact on regional wage differentials and therefore on subsequent migration rates. A fully specified general equilibrium model would surely predict a future convergence in regional wages in response to contemporary migrations, and future out-migration rates from low-wage areas should decline as a result. This effect is likely to be reinforced by the continued more rapid growth of nonfarm labor demand in the South, and by the deterioration in northern urban services. In fact, recent evidence on gross migration rates suggest very large declines over the past decade in interregional black migration,[7] so it would appear all the more restrictive to assume stability in migration rates. We should emphasize, however, that the observed current decadal decline in gross black migration rates need not conflict with the assumption of constant age-education-sex-specific migration rates. Migration from the South specific to the young, highly educated male implies a shift in the mix of the southern population retained and thus a future decline in overall rates of out-migration. Furthermore, as the southern potential migration stock declines, so too will the numbers of future out-migrants. In fact, our model predicts future declines in overall rates of black out-migration from the South consistent with the evidence from the 1960's.[8]

In summary, we recognize that our projection procedure is somewhat mechanical and inconsistent with conventional economic theory. But the Markov model is a simple and useful technique for analyzing migration flows and their impact on the relative income position of blacks over short time periods. In fact, no operational alternative appears to be available.

The results are summarized in Tables 8-10. The first of these indicates the extent to which the "black problem" becomes increasingly centered on the urban North. Based on the assumptions made, the proportion of male blacks living in the urban North will continue to increase to more than 57 percent by 1987. The only southern regions which make relative gains in their share of the black male labor force are the large southern SMSA's.

Table 8. Estimated Distribution of Black Male Labor Force by Region, 1967-87: Absolute (000) and Percentage (in parentheses)

Region	1967	1972	1977	1982	1987
Rural South	679.7 (16.30)	713.1 (15.42)	777.5 (14.29)	790.2 (12.60)	810.8 (11.25)
Small-town South	385.8 (9.25)	258.5 (5.44)	194.5 (3.58)	123.7 (1.92)	94.4 (1.31)
Small-SMSA South	236.5 (5.67)	280.6 (6.09)	331.9 (6.10)	388.0 (6.06)	447.0 (6.20)
Large-SMSA South	825.0 (19.79)	1012.9 (21.99)	1275.7 (23.44)	1503.9 (23.98)	1723.8 (23.92)
Non-South	2041.9 (49.99)	2341.0 (51.06)	2860.5 (52.59)	3464.8 (55.44)	4158.1 (57.32)
Total	4168.9	4606.1	5440.	6270.6	7234.

Table 9 presents projected educational distributions over the next two decades. Even under our conservative assumptions, the educational attainment of black males is likely to undergo substantial changes over very short periods of time--shedding some doubt on Thurow's pessimistic predictions. By 1972, for example, the share of the labor force with 8-11 years of schooling increases by almost 9 percentage points! The most dramatic changes occur over the decade 1967-77. By 1977 the share

Table 9. Estimated Distribution of Black Male Labor Force by Education Class, 1967-87: Absolute (000) and Percentage (in parentheses)

Years of schooling completed	1967	1972	1977	1982	1987
0-7	1373.0 (32.93)	1223.0 (26.55)	1059.8 (19.48)	949.0 (15.13)	879.8 (12.21)
8-11	1375.7 (32.99)	1921.3 (41.71)	2306.5 (42.39)	2652.3 (42.29)	3044.9 (42.26)
12	950.7 (22.80)	1002.5 (21.76)	1433.2 (25.79)	1852.2 (29.53)	2300.9 (31.93)
12+	469.6 (11.28)	459.2 (9.98)	640.5 (12.34)	817.0 (13.05)	1008.5 (13.60)
Total	4169.0	4606.0	5440.0	6270.5	7234.1

of those with less than 8 years of schooling declines by almost 12 percent, those with 8 to 11 years rise by slightly less than ten percentage points, while those with a high school diploma increase by three percentage points. The changes in the stock of human capital are less impressive over the period 1977-87.

Part of the explanation for this can be found in Table 10. Between 1967 and 1977 an unusually large influx of young males will enter the labor market with, of course, much higher educational levels than the average. This trend reverses from 1977 to 1987. The source of these shifts can be found of course, in the post-World War II population boom.[9] In the pages which follow we shall attempt to evaluate the impact of these dramatic (and off-setting) distributional changes on black incomes.

Altogether, if the migration and mortality rates observed in the mid-1960's should persist and if young males attain the levels of education typical of their regions of education in 1967, then we can expect in the 1980's to find a younger black work force with a considerably improved education increasingly concentrated in both the North and large southern SMSA's. If mortality rates continue to decline and educational attainment continues to improve, one might expect a slightly older and better educated black male work force than that shown in Tables 8-10, but the differences are unlikely to be large. On the other hand, if southern black employment conditions continue to improve relative to those in the North, as might be expected with continued migration, the northern portion of the black population in the 1980's will be lower than projected. The retention of a larger black population in the South than that shown in Table 8 would result in our overstatement of the future education of the population, but the relatively improved conditions in the South would certainly imply improved education and income levels there. Altogether, it seems likely that our projection overstates the northern share of the future black labor force, but it may either overstate or understate its education.

Table 11 presents projected average incomes to 1987. These are based on 1967 cell mean (earned) incomes weighted by the projected distribution of black males summarized in Tables 8-10. In effect, we assume no change in black incomes except that which can be explained by embodied quality improvements, e.g., changes in education, age, or location. (These restrictive assumptions are revised on p. 26.)

In spite of the impressive improvements in education and the extensive migration to the North expected in the next two decades, the projected average income gains based on labor quality alone are certainly disappointing and far below the experience of the American labor force as a whole prior to the 1960's.[10] Average incomes are expected to decline through 1972; even by 1987 they show only a 2.4 percent increase over 1967. Moreover, this small improvement is entirely attributable to migration. Projected incomes are lower in 1987 than in 1967 within each region. Thus the only significant source of improvement in average black male incomes over the next two decades will be due to general growth in the economy; that is, any overall improvement will come from capital formation, embodied technical changes, and other forces above quality improvements in the black labor force.

This disturbing prognosis is explained in part by the great increase in the expected numbers of young black workers in the labor force and the resulting reduction in average age. Table 12 exhibits projected average incomes generated by changes in education, region of education, and region of current residence, while assuming the age distribution to remain stable. In effect, it shows the improvement due to migration and education that an average black male of a given age is expected to enjoy

Table 10. Estimated Distribution of Black Male Labor Force by Age, 1967-87: Absolute (000) and Percentage (in Parentheses)

Age	1967	1972	1977	1982	1987
20-24	623.2 (14.94)	951.9 (20.67)	1358.7 (24.97)	1404.0 (22.39)	1536.8 (21.24)
25-29	545.7 (13.09)	612.0 (13.29)	934.7 (17.18)	1334.2 (21.27)	1378.7 (19.05)
30-34	513.9 (12.32)	533.7 (11.59)	598.5 (11.00)	914.2 (14.58)	1304.9 (18.03)
35-39	464.6 (11.14)	499.0 (10.83)	518.2 (9.53)	581.2 (9.27)	887.7 (12.27)
40-44	506.0 (12.16)	446.0 (9.68)	479.1 (8.81)	497.5 (7.93)	557.9 (7.71)
45-49	444.5 (10.66)	477.6 (10.37)	421.0 (7.74)	452.2 (7.21)	469.6 (6.49)
50-54	420.4 (10.08)	410.7 (8.92)	441.3 (8.11)	389.0 (6.20)	417.9 (5.78)
55-59	365.2 (8.76)	375.4 (8.15)	366.7 (6.74)	394.1 (6.28)	347.4 (4.80)
60-64	285.7 (6.85)	299.7 (6.50)	321.7 (5.92)	304.1 (4.87)	333.2 (4.63)
Total	4169.2	4606.0	5439.9	6270.5	7234.1

Table 11. Average Projected Earned Income for Working Age Black Males, by Region: 1967-87[a]

Region	1967	1972	1977	1982	1987
Rural South	$2084	$1886	$1906	$1981	$1946
Small-town South	2442	1942	1842	1811	1858
Small-SMSA South	3240	3026	2943	2863	2851
Large-SMSA South	3818	3473	3390	3478	3640
Non-South	4812	4729	4555	4592	4643
U.S.	$3862	$3752	$3708	$3834	$3955

[a]Incomes are in 1966 prices, and working age is defined as age 20-64. The projections are based on the 1966-67 SEO income weights (see text).

relative to a black male of the identical age in 1967. Once the drastic age change is eliminated, the gains become more impressive, though they still are only 0.48 percent per year over the twenty-year period as a whole and fall considerably below the achievements of the American labor force 1929-65. Furthermore, migration is seen to play an important role in Table 12 since none of the five regions enjoys income improvements approaching the national average. In fact, even when the effects of age are eliminated, the North exhibits little or no improvement in average income levels. The relatively low quality of in-migrants continues to offset the efforts to increase the skill level of the current stock of blacks resident there.

Table 12. Average Projected Earned Incomes for Working-Age Black Males by Region, Assuming 1967 Age Distributions, 1967-87

Region	1967	1972	1977	1982	1987
Rural South	$2084	$2138	$2183	$2205	$2225
Small-Town South	2442	2409	2427	2366	2462
Small-SMSA South	3240	3279	3344	3463	3504
Large-SMSA South	3818	3815	3921	3992	4087
Non-South	4812	4784	4841	4878	4894
U.S.	$3862	$3937	$4068	$4191	$4285

To the changes in incomes in Tables 11 and 12 attributable to changes in labor quality should be added the expected changes in real national income per capita over the period attributable to augmentation

of the quality-adjusted capital stock and disembodied technical progress. Denison (1962) predicted that 60 percent of the increase in real national income per capita between 1960 and 1980 would be due to increased land and capital per employed person (7 percent), to better utilization of women workers (6 percent), to changing hours worked per year (-22 percent), and to increased output per unit of input due to advances in knowledge, reduced lags in its application, and economies of scale (69 percent).[11] If blacks of a given age participate equally in general economic growth, and if these elements account for 60 percent of growth in the period 1967-87, then their earnings will rise relative to the population as a whole if real national income per person increases at an annual rate of 1.2 percent or less.

Table 13. Sources of Growth in Black Incomes Due to "Quality" Improvements, 1967-87

Contribution of Changing	Income	Income Change 1967-87
Age	$3835	$ -27
Education	4170	+308
Migration	4141	+279
Age and education	4035	+173
Age and migration	4063	+201
Migration and education	4287	+425
Education, age, and migration	4123	+261
All Sources	3955	+93

If per capita income rises more rapidly than this, as seems probable, black (age-adjusted) incomes will decline relative to nonblacks.

Our final task is to determine the sources of projected black income and poverty changes attributable to four basic variables influencing embodied labor quality improvements: (i) age, (ii) education levels, (iii) source of education, and (iv) migration. The results are reported in Table 13. The impact of each variable is computed by re-estimating 1967 incomes, holding all variables at 1967 levels except one which is allowed to assume its 1987 value. The change in average income attributable to each "source" appears in the second column.

Education and migration by themselves significantly contribute to the projected black income improvement over these two decades. When interactions are allowed the net impact on incomes is still impressive; an increase of $425 or 0.52 percent per annum.[12] Were we to ignore the negative effects of (i) the massive influx of young blacks into the labor market and (ii) the increasing importance of urban schools in producing graduates and the income disadvantage associated with those regionally specific educations, then indeed we would observe moderate improvements in black incomes during the 1970's and 1980's. Unfortunately, the forces listed above under (i) and (ii) are likely to dominate black income experience in the years to come. The net effect is the discouraging result reported earlier.

IV. CONCLUSIONS

The major conclusions of this paper may appear alarming, but they contain more hopeful elements than were forthcoming from earlier studies. If blacks merely retain the advances in education typical of the mid-1960's and continue to migrate at the rates observed in that period, they

seem almost certain to experience a decline in their relative incomes in the 1970's and probably even into the 1980's.

Nevertheless, the inferiority of southern black schools (and especially southern rural black schools), alleged by the Coleman Report to account for the poverty of black migrants to the North, can be discounted. Indeed, the overall effect of a northern or large southern urban ghetto environment appears to be more harmful to black economic progress than is a rural southern origin. We cannot confirm this assertion with certainty since we have been unable to eliminate wholly the selective migration effect.

It appears that in 1967 education generated returns to blacks that were as high as those enjoyed by whites in 1960. The great increase in the payoff from black education during the 1960's occurred at every education level and is unlikely to be explained by mere window dressing on the part of corporations and government agencies.

We feel there is sufficient evidence that further investment in black education will generate further economic progress for the black population relative to the white. Projecting the educational achievements of young working age black males and allowing for expected changes in the source of education, we estimate that less than half of the black male population will have completed high school in 1987. With sufficient investment channelled into improving the quality of elementary and secondary education available to ghetto-dwellers and southern blacks alike, with improved access to advanced education and continued access to employment opportunities commonly associated with such skills, we may avoid the bleak future to which a mere perpetuation of past accomplishments would seem to condemn us.

APPENDIX A. METHOD OF PROJECTION

Empirical applications of the capital theoretic framework to migration behavior have successfully isolated key demographic--economic determinants of the migration decision in a static partial equilibrium framework (Becker, 1964; Bowman, 1965; Carnoy, 1967; Fein, 1965; Sjaastad, 1962). These studies confirm the importance of sex, education, and age in determining the returns to spatial migration. Thus it seems clear that any attempt to predict future spatial migration by American blacks requires information on age-, sex-, and education-specific migration rates by black males. The SEO data (1967) yield such information for one recent point in time.

Our procedure in this section will be to assume stability in these migration rates over the subsequent two decades. Although this key assumption imposes serious limitations on an analysis of future spatial distributions of the American black population (see Kelley and Weiss, 1969), it seems to us the only viable model useful for effectively capturing the influences of migration and regionally specific quality of education on the incidence of poverty and income levels in Northern urban ghettos.

Our projection procedure is described below. Our concern is only with black males. We deal first with those of ages greater than 15 at the time of interview. Educational attainment is denoted by subscript i, where

i	Years of Schooling Completed
1	0-7
2	8-11
3	12
4	13+

and age in 1967 by subscript j, where

i	Age Class in 1967
1	0-4
2	5-9
3	10-14
4	15-19
5	20-24
⋮	⋮
12	55-59
13	60-64
14	65+

For all black males j = 4, 5 . . . 13 we have (10 x 4) = 40 migration matrices,

$$k \left\{ \overbrace{\left[M_{ij}^{k\ell} \right]}^{\ell} \right.$$

the elements of which yield the migration probabilities from region k to ℓ where

k,ℓ	Region
1	Rural South: less than 2,500
2	Small-city South: Non SMSA > 2,500
3	Medium-city South: SMSA < 250,000
4	Large-city South: SMSA > 250,000
5	North

The sum of the probabilities in any row of any matrix $M_{ij}^{k\ell}$ is always 1.0. The method for estimating these probabilities from the SEO tape is explained in Appendix B.

We define a current residence matrix, $R_{ij}^{k\ell}$ (67), whose rows are residences at age 16 and whose columns are current residence. By applying the five-year survival and migration probabilities to $R_{ij}^{k\ell}$ (67) we intend to generate $R_{ij}^{k\ell}$ (t) for t = 1972, 1977, 1982, 1987. Age-specific survival rates can be represented by a scaler, s_j , which is assumed to be independent of i, k, ℓ, and constant over time. For a given residence at age 16, the appropriate matrix operation is, then

$$k=1 \quad \overbrace{\left[R_{ij}^{k=1,\ell}(67)\right]}^{\ell} \cdot k \left\{ \overbrace{\left[M_{ij}^{k\ell}\right]}^{\ell} \cdot s_j = \left[R_{ij+1}^{k=1,\ell}(72)\right] \right.$$

which can be expanded for all residence classes at age 16,

$$k \left\{ \overbrace{\left[R_{ij}^{k,\ell}(67)\right]}^{\ell} \right. \cdot k \left\{ \overbrace{\left[M_{ij}^{k\ell}\right]}^{\ell} \cdot s_j = \left[R_{ij+1}^{k,\ell}(72)\right] \right.$$

Since our interest is with residence behavior over time as well as with spatial characteristics of the black population two decades hence, the following intermediate steps were computed:

$$(1.0) \quad \begin{cases} \left[R_{ij+1}^{k,\ell}(72)\right] = \left[R_{ij}^{k,\ell}(67)\right] \cdot \left[M_{ij+1}^{k\ell}\right] \cdot s_{j+1} \\ \left[R_{ij+2}^{k,\ell}(77)\right] = \left[R_{ij+1}^{k,\ell}(72)\right] \cdot \left[M_{ij+2}^{k\ell}\right] \cdot s_{j+2} \\ \left[R_{ij+3}^{k,\ell}(82)\right] = \left[R_{ij+2}^{k,\ell}(77)\right] \cdot \left[M_{ij+3}^{k\ell}\right] \cdot s_{j+3} \\ \left[R_{ij+4}^{k,\ell}(87)\right] = \left[R_{ij+3}^{k,\ell}(82)\right] \cdot \left[M_{ij+4}^{k\ell}\right] \cdot s_{j+4} \end{cases} \quad \begin{array}{l} i = 1, 2, \ldots 4 \\ j = 5,6, \ldots, 14 \\ k,\ell = 1, 2, \ldots, 5 \end{array}$$

This procedure accounts for only the black male labor force aged 20 or older in 1967. Another method is needed to make projections for persons in age groups j = 1, 2, 3 and 4 in 1967. Such projections involve two problems: to impute future migration patterns to children ages 0-14 and to estimate the future educational attainment of those age 0-19 in 1967.

The first problem is met by assigning to persons under age 15 the migration behavior of their mothers. Specifically, migration probability matrices $\left[W_j^{m,\ell}\right]$ were constructed for j = 2, 3 where the columns (ℓ) represented the current residence of all wives or female heads of households and the rows (m), their residences five years earlier. The elements of these matrices are the percentage distributions of male children living

in households of these female heads and wives. By multiplying vectors $r_j(67)$ by such migration matrices we can predict the subsequent geographical distribution of young people. For instance, for persons age 0-4 in 1967:

$$[r_{j=2}\ (72)] = [r_{j=1}\ (67)] \cdot s_{j=2} \cdot \left[W^{m,\ell}_{j=2}\right],$$

$$[r_{j=3}\ (77)] = [r_{j=2}\ (72)] \cdot s_{j=2} \cdot \left[W^{m,\ell}_{j=3}\right]$$

Similarly, the vector $[r_{j=3}(72)]$ was estimated using $W^{m,\ell}_{j=3}$. The vectors $r_{j=3}(t)$ were next converted to diagonal matrices and multiplied by the survival rate and migration matrix for age group j = 4 to yield residence matrices classifying persons aged 15-19 by "region at age 16" (k) and current region (ℓ). For instance, for those in age group j = 3 at time t, the calculation was:

$$\begin{bmatrix} r_3^1(t) & - & - & - & - \\ - & r_3^2(t) & - & - & - \\ - & - & r_3^3(t) & - & - \\ - & - & - & r_3^4(t) & - \\ - & - & - & - & r_3^5(t) \end{bmatrix} \cdot s_4 \cdot \left[M^{k,\ell}_{j=4}\right] = \left[R^{k,\ell}_{j=4}(t+1)\right]$$

In effect we assumed in these projections for persons under 15 in 1967 that their regions of residence at 16 was their region of residence at age 10-14.

In order to estimate the educational attainment of persons under 20 in 1967 (j = 1, 2, 3, 4) a series of five vectors $\left[e^k_{i,j=5}\right]$ were derived from the SEO tape showing the educational attainment of males aged 20-24

in 1967. There was one such vector for each region of residence at age 16 (k). These vectors were multiplied by the appropriate rows of the matrix $\left[R^{k,\ell}_{j=4}(t)\right]$ to produce four matrices $\left[R^{k,\ell}_{i,j=4}(t)\right]$, one for each education class (i). In effect, we assumed that education class depends on estimated region of residence at age 16, that it is fully determined by age 20-24, and that the distribution of educational attainment for persons from a given region will not change in the future from that for persons aged 20-24 in 1967.

The four matrices so derived were manipulated in the same way in projecting regions and educations for persons in age group 5, 6, and 7 in 1972-77 as the $\left[R^{k,\ell}_{i,j}(t)\right]$ matrices derived directly from the SEO tape had been used for higher age groups.

Altogether, we derived a four-dimensional 900-cell matrix for 1967 from the SEO tape and projected four further matrices of the same dimensions for subsequent periods of the form

$$\left[R^{k,\ell}_{i,j}(t)\right]$$

$$\begin{aligned} i &= 1, 2, 3, 4 \\ j &= 5, 6, \ldots, 13 \\ k &= 1, 2, \ldots, 5 \\ \ell &= 1, 2, \ldots, 5 \\ t &= 1967, 1972 \ldots 1987 \end{aligned}$$

In projecting black male incomes, a mean income $y^{k,\ell}_{i,j}(1967)$ was computed for each cell in the above matrix. Subsequent overall mean incomes were then computed by multiplying these $y^{k,\ell}_{i,j}(1967)$'s by the projected numbers of persons in the appropriate cells, summing these products, and dividing by the projected overall black male population. Similarly, the percentage in each cell below our arbitrary "poverty" lines ($2700 in the rural South and $3200 elsewhere) was derived for

each cell in 1967 and these percentages were then applied to the projected populations in each cell to determine the projected proportions of black males whose income from self-employment and work would leave them below the poverty line in subsequent years (see Appendix C), The only sources of change in projected average black income or percentages in poverty is a redistribution of blacks among cells in $\left[R_{i,j}^{k,\ell}(t)\right]$ as t changes. To this must be added the general growth in income per capita to be expected over the period 1967-87.

APPENDIX B. THE ESTIMATION OF FIVE-YEAR TRANSITION PROBABILITIES

The SEO did not include a question on residence five years earlier, so the transition probabilities in M_{ij}^{kl} had to be estimated from the answers to questions about age (A), residence at age 16 (R16), age at last move (ALM), residence at last move (RLM), and residence in 1967 (R67). Our concern was to estimate residence five years earlier or in 1962 (R62) for each black male age 15 or over in the SEO tape so that he could be inserted into a 5 x 5 migration frequency matrix for his age, and education class. R62 had also to be estimated for all wives and female heads of households with children to permit the construction of migration frequency matrices for male children under 15. The estimates of R16 were made using the following rules:

1) For all persons, if the answer to the question about ALM was that they had never moved, then

R62 = R67

2) For persons aged 20 or 21,

R62 = R16

3) For all others, if $(A - ALM \geq 5)$ then

R62 = R67

4) For persons aged 30 and over, if $(A - ALM \leq 5)$ then

R62 = RLM

In effect we assume that persons 30 and over in 1967 had made no more than one move in the previous five years.

5) For persons aged 22-29, if $(A - ALM \leq 5)$, then the person was split between R16 and RLM in inverse proportion to the time elapsed from his sixteenth year to 1962 relative to the time elapsed from 1962 to his

last move. More precisely, the fraction $\frac{A - 16 - 5}{ALM - 16}$ was added to to the total frequency in the cell where R62 = RLM and the fraction $\frac{ALM - (A - 5)}{ALM - 16}$ was added in the cell where R62 = R16. In effect this assumes that persons aged 22-29 in 1967 made no more than two moves since they were 16; there is some probability that both moves had occurred in 1962-67.

6) For persons aged 17-19, if ALM > 16, then

R62 = R16

7) For persons aged 17-19, if A - ALM < 5 and ALM < 16, then

R62 = RLM

8) For persons aged 15-16, if A - ALM < 5, then

R62 = RLM

In effect, we assume that persons aged 15-19 made only one move in 1962-67.

As the R62's were estimated, forty migration frequency matrices were built up for males aged 20-64 classified by age and education. A single matrix was built up for males aged 15-19 because education was not yet determined for this group in 1967. Two migration frequency matrices were created containing all male children aged 5-9 and 10-14. Each individual in these two matrices was assigned the R62 of the wife or female head of the family in which he was found. As a result, the R62 for a particular wife or female head would be used once for each male child living with her. The same R62 estimate could be used in both matrices if she had children in both age groups, and it would be used as many times as she had children.

The SEO tape reports the weights to be assigned individuals in estimating national totals, but these were not used in creating the migration frequency matrices. Each individual on the tape was given

equal weight in these matrices. The reason is that two quite different weights were used in the SEO. Very high weights were assigned to persons who had been chosen as part of the Current Population Survey sample, while much lower weights were given persons in the augmented poverty sample. Since individual cells in the migration matrices (especially off-diagonal cells) often contained very few individuals, the use of these very unequal weights could sometimes result in wild transition probabilities. The weights were used in allocating the initial population among cells in $R_{ij}^{kl}(1967)$ and therefore in estimating $R_{ij}^{kl}(t)$ for later years and y_{ij}^{kl} (see Appendix A).

Once the 1962-67 migration frequency matrices were constructed, it was a simple matter to convert these into transition probability matrices by dividing the frequencies in each row by the row sum. It was the resulting M_{ij}^{kl} matrices that were assumed constant over the 1970's and 1980's in projecting future $R_{ij}^{kl}(t)$'s.

APPENDIX C. THE INCIDENCE OF POVERTY

For some readers, estimates of the incidence of poverty may be more useful than average incomes as an index of economic position of black males. This requires two data inputs. First, knowledge of the distribution of income by age, education, region of location, and region of education in 1967. We shall assume these distributions within cells to be stable over time. Second, it requires the acceptance of a consistent poverty "cutoff line." Somewhat arbitrarily, we have used the following rule: the percent in poverty are derived using a 1966 poverty line where $2800 is applied to the rural South and $3300 to other regions. It should be emphasized that we experimented with alternative measures, such as those developed from "low cost budget" estimates, and the secular behavior of the incidence of poverty were only marginally affected.

The results are presented in Table C-1 and Figure C-1. They are fairly consistent with the conclusion reported in the text of this paper based on average incomes. Both for the United States as a whole and for the nonrural United States, the percent of black males in poverty declines consistently, though moderately, over time. The exception to this rule is the period 1972-77, when little progress is made.

The prime explanation for this trend is the continued high out-migration from the poor South to urban areas both North and South. This can best be seen by examining the percent in poverty for these urban areas. For the urban North, there is no visible improvement over the two decades. In fact, the problem worsens there during the period 1972-77. Similar results are forthcoming for the urban South. In the urban South, the percentage in poverty increases from 1967 to 1977, and begins a steady

Table C-1

Black Poverty Projections: 1967-87
(Percentages)[a]

Region	1967	1972	1977	1982	1987
Rural South	73.72	72.06	70.88	67.16	65.82
Small-town South	75.69	74.14	78.05	81.53	79.01
Small southern SMSA	61.20	57.22	52.77	52.94	51.13
Large southern SMSA	48.79	48.89	50.25	47.38	43.30
Non-South	28.89	27.23	28.92	27.53	27.30
Non-rural U.S.	44.06	41.01	41.70	39.30	37.77
U.S.	49.29	45.75	45.73	42.63	40.64

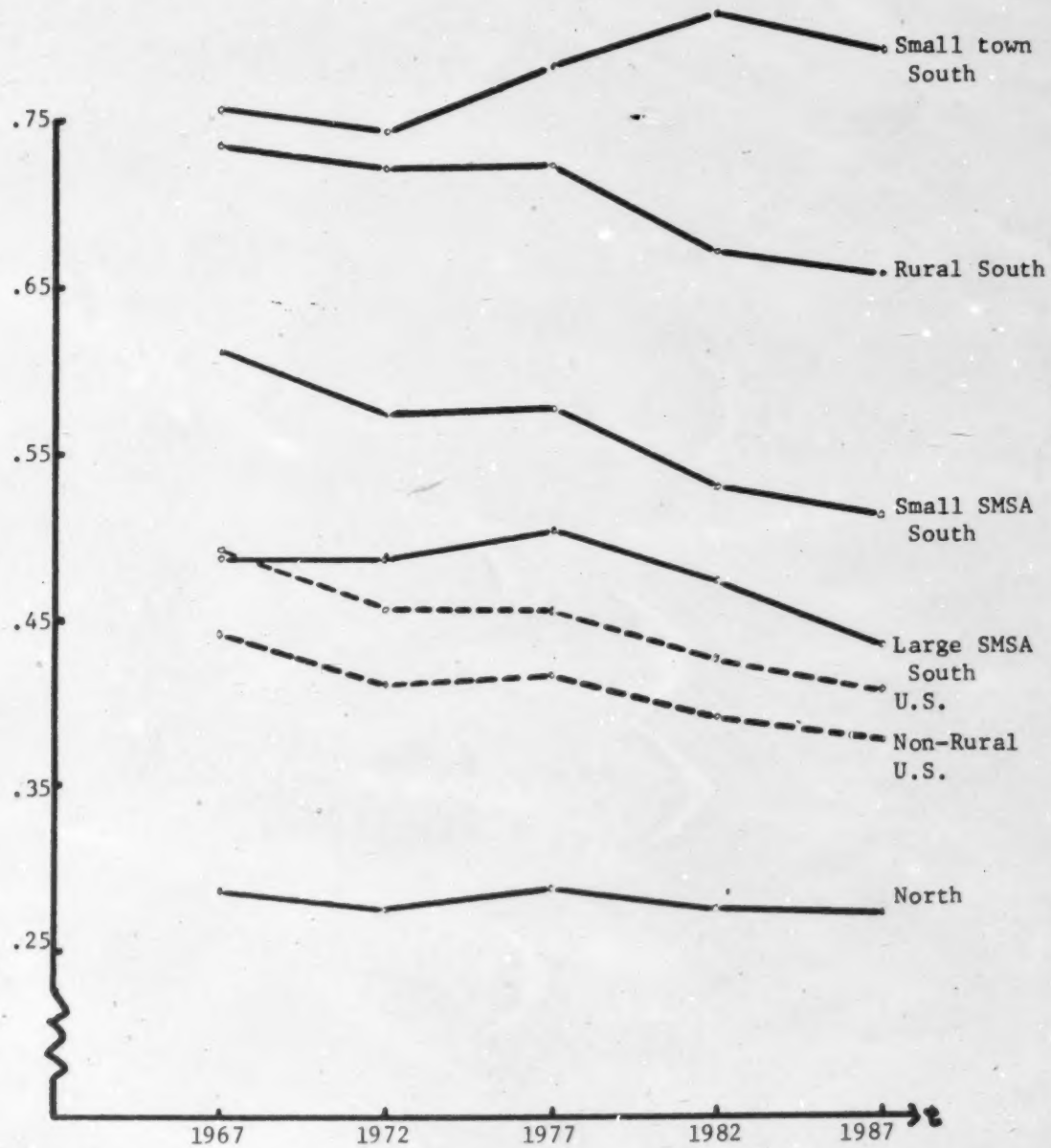
[a]The percent in poverty figures are derived using an approximate 1966 "poverty line" where $2800 is applied to the rural South and $3300 to other regions. The calculation assumes stability in the distributions within each age-education-region cell, and utilizes the observed distribution in the 1967 SEO data file.

decline only after the late 1970's. Policymakers will find no comfort in these results. Though the immigrants from nonurban areas are the very best, on the average, that these sending regions have to offer, their low quality will overwhelm efforts to eliminate black poverty by educating the indigenous Northern blacks.

Nevertheless, southern educational efforts in the rural and small-city South should payoff by impressive declines in poverty there. The fear that out-migration will denude these sending regions of human capital does not appear to be founded on the basis of our model.

Figure C-1

Percentage Black Males in Poverty
by Regions: 1967-1987



Source: Table C-1.

NOTES

[1]One of the important conclusions of the Coleman Report was that student achievement is influenced as much by the quality of educational inputs as by the socioeconomic characteristics of the home and community (R. Weiss, 1970, p. 10). Regional dummy variables capturing source of education should capture both of these effects. The evidence regarding the large regional variance in the quality and quantity of educational inputs per student is well documented.

[2]An obvious counter-argument is that the lower incomes of persons educated in the North are due to the selective migration effect since most of the native northerners are still there and must be compared with the superior southern blacks who have migrated to the North. Yet, the negative effect of originating in the large-SMSA South holds up within most regions. The stronger negative effect in the logarithmic regression suggests that large-city origin tends to increase inequality, perhaps by producing a larger proportion of unemployable persons, but this is pure conjecture. The large southern SMSA's were initially defined as a separate group because they are so heavily concentrated in the border states. A third of the blacks in large southern SMSA's in 1960 were in Washington, Baltimore, Louisville, and Wilmington, and more than half were in those cities plus the large cities of Oklahoma and Texas. We had expected that residence in these cities at age 16 would have a positive effect on earnings relative to rural southern origins.

[3]The one group who benefited from being educated in the North or the large-SMSA South were those aged 40-49 in 1967. These were in primary school between 1924 and 1941 and in secondary school between 1932 and 1945. Most of them were in World War II and entered the labor force during the war or the postwar boom.

[4]The human capital function is estimated in the following form:

$$\ell n\, Y = \ell n\, A + b_1 \ell n Ed_1 + b_2 \ell n Ed_2 + b_3 \ell n Ed_3 + c_1 \ell n Ex_1 + c_2 \ell n Ex_2 + c_3 \ell n Ex_3 + c_4 \ell n Ex_4,$$

where Ed_i ($i = 1, 2, 3$) refers to years of schooling to a maximum of 8, 12, and more than 12 years respectively and Ex_k ($k = 1, 2, 3, 4$) refers to years of experience to a maximum of 5, 15, 35 and more than 35 years respectively. Ex_k is calculated by subtracting the age at which an individual started work from his current age. We assume with Thurow that an individual started work at eighteen if he finished school by that age or earlier. If not, work began at school-leaving age (see Thurow, 1969, pp. 72-76 and 187-88).

To calculate education and experience elasticities, the b and c coefficients are added together. For example, the elasticity for the 0-8 years educational range is $b_1 + b_2 + b_3$, the elasticity for the 9-12 years range is $b_2 + b_3$, and the elasticity for the above 12 years range is b_3 (Thurow, 1969, p. 187).

Notes - cont'd

[5]Our most advanced education class is for those with more than 12 years of schooling. Thus most persons in the 20-24 age group who are going to reach this educational level have already done so.

[6]The survey did not ask for the respondent's residence of five years earlier, but it was estimated by using the respondent's current residence, his residence one year earlier, and his residence at age 16. See appendix B for details.

[7]If this trend continues, we will overstate the northern share of the future black labor force and thus overstate black incomes. If, on the other hand, the decline in the 1960's is only temporary, then our 1967 rates may be too low, producing an understatement of the northern share and black income.

[8]If the stock of population is fixed, then it is obvious that the Markov model will produce declining rates of out-migration over time. In our case, the stock of potential migrants age 20-64 is continually augmented by young entrants to the labor force. Thus the traditional Markov predictions may be violated (see Kelley and Weiss, 1969).

[9]See Easterlin (1966) for an excellent discussion of the "echo effect" and the impact of the "baby boom."

[10]From 1929 to 1965, Thurow (1969) estimates labor's marginal product to have increased at an annual rate of 2.4 percent, while that rate attributable to "quality" improvement--our concern in this paper--is 0.7 percent per annum.

[11]E. F. Denison (1962), p. 270. The remainder was 23 percent attributed to changes in the education and sex-age makeup of the labor force plus 1 percent due to the industry shift from agriculture. The blacks' share of these changes is included in our projections.

[12]This figure is considerably lower, however, than that experienced by the entire American labor force, 1929-65.

REFERENCES

G. S. Becker, Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education. New York: National Bureau of Economic Research, 1964.

M. J. Bowman, "Human Inequalities and Southern Underdevelopment," Southern Economic Journal (July 1965), pp. 73-102.

M. Carnoy, "Aspects of Labor Force Mobility in Latin America," Journal of Human Resources (Fall 1967), pp. 517-37.

J. S. Coleman, Equality of Educational Opportunity. Washington, D.C.: U.S. Office of Education, 1966.

E. F. Denison, The Sources of Economic Growth in the United States and the Alternatives before Us. CED, 1962.

R. A. Easterlin, "Economic-Demographic Interactions and Long Swings in Economic Growth," American Economic Review (December 1966), pp. 1063-1104.

R. Fein, "Educational Patterns in Southern Migration," Southern Economic Journal (July 1965), pp. 106-24.

G. Hanoch, Personal Earnings and Investment in Schooling. Unpublished Ph.D. dissertation, University of Chicago, 1965.

J. C. Kain and J. Persky, "The North's Stake in Southern Rural Poverty," in Rural Poverty in the United States (Washington, D.C., 1967), pp. 288-310.

A. C. Kelley and L. W. Weiss, "Markov Processes and Economic Analysis: The Case of Migration," Econometrica (April 1969), pp. 280-97.

L. A. Sjaastad, "The Costs and Returns of Human Migration," Journal of Political Economy (October 1962), pp. 80-93.

L. Thurow, Poverty and Discrimination. Washington, D.C.: Brookings Institution, 1969.

R. D. Weiss, "The Effect of Education on the Earnings of Blacks and Whites," Review of Economics and Statistics (May 1970), pp. 150-59.